Education and Long Term Social Mobility in Benin [*]

Leonard Wantchekon[†]

February 21, 2016

Abstract

This paper uses a unique data set from the first regional schools in colonial Benin to document and measure intergenerational mobility and its effect on risk aversion, work ethics, mental health and life outlook. The study covers the first generation of students and their unschooled counterparts following the establishment of colonial and missionary schools as well as their descendants for the following two generations. We find evidence of upward mobility across generations on education. However, the evidence suggests that the second generation moved up and third generation moved down from their parents' income levels. This points to a decline in the returns to human capital from the second to the third generation. A possible explanation for this result is the dominance of formal sector employment by the public sector: in our data, 67% of the third generation respondents with at least a high school education are low-wage civil servants and only 3% are entrepreneurs. We also find that downward mobility is associated with more risk aversion, and weaker work ethics and more negative life outlook. We provide evidence for causality by exploiting the plausibly exogenous variation in education treatments in colonial Benin (Wantchekon et al. 2015) and using assignment of education to grandparents to instrument for mobility. Overall, the paper provides a family-centric framework for the study of economic development and documents social mobility's effects on the behavioral capacity of individuals.

1 Introduction

Intergenerational Social Mobility (ISM) refers to the relationship between parents' socioeconomic status and that of their children. It measures how better off or worse off descendants are compared to their parents and captures the way personal capabilities, family background, social environment and public policies shape individual well-being. As micro evidence for economic progress, intergenerational social mobility is of considerable importance for a better understanding of the social mechanics of development, especially the role of human capital in promoting growth and reducing income inequalities. This paper aims to contribute to existing literature on intergenerational social mobility and its psychological effects.

The study uses a unique social and demographic dataset from the first regional schools in colonial Benin to uncover intergenerational human capital externalities and social mobility across three generations. We also investigate the causal effect of intergenerational mobility on the current generation's attitudes toward risk, work ethics, and mental health and life outlook. As such, the paper makes at least two important advances in the ISM literature. First, the paper is the first to study social mobility with a carefully crafted, quasi-experimental data over three generations. The data enables a plausibly exogenous model of ISM, using colonial educational provision as an exogenous shock that mitigates potential endogeneity concerns. Finally, the paper contributes to current research on behavioral economics and social psychology by investigating the way affects psychological wellbeing and socioeconomic progress.

We find three main results of interest. First, consistent with Wantchekon et al. (2015), there is a marked increase in ISM between the first and second generations in both income and education. Second, there was clear downward mobility between the second and third generations on income and upward mobility on education. This points to a decline in the returns to human capital from the second to the third generation, which we attributed in part to the dominance of formal sector employment by the public sector. In the data, 80% of the third generation respondents with at least a high school education are low-wage civil servants and only 5% are entrepreneurs. Finally, there is clear evidence that stagnating mobility had an adverse effect on the third generation's psychological wellbeing.

2 Literature Review

The existing social mobility literature focuses largely on the relationship between social mobility and income inequality at the macro-level. Several studies note that countries with higher cross-sectional income inequality have lower rates of intergenerational income mobility, a relationship often referred to as the "Great Gatsby Curve" (Krueger 2012). For example, Aaronson and Mazumder (2005) conduct a study using U.S. census data dating back to 1940 in which they implement a two-sample instrumental variable estimator to stimulate the effect of a father's income on a son's income. They find, unsurprisingly, that lower social mobility is strongly correlated with higher income inequality. While they do not find large variation between states, Chetty et al. (2014) specifically examine heterogeneity in intergenerational mobility rates across the United States and find that in addition to income inequality, ISM is also strongly correlated with residential segregation, school quality, and family structure.

Our study makes a significant contribution to ISM literature by extending the examination of the link between social mobility and income to developing countries. Additionally, our social mobility measurement uses data from a sample of individuals, which enables the study to provide a more expanded micro-level analysis including a more rigorous exploration of the mechanisms of intergenerational transmission of human capital and social status. Furthermore, the data offers detailed information about a critical moment in the history of African families by focusing on when education opportunities were first introduced and then documenting the lives of subjects and their descendants for multiple generations. This approach allows us to examine social mobility across multiple rather than only two generations and to exploit a plausibly exogenous shock in the form of formal education to, investigate the causal effects of mobility on wide range of outcomes.

In addition to examining the way exogenous shock to grandfathers income impacts the social status of subsequent generations, this paper studies the relationship between social mobility and individual behaviors and attitudes. We investigate the way upward or downward movements in income from parents to children affect risk attitudes and the psychological wellbeing of the latter. Durlauf and Shaorshadze (2014) measure social mobility using intergenerational elasticity and find that mobility is correlated with overall income equality in a country. They also examine how the correlation of income across generations could be the result of the intergenerational transmission of

attitudes. They highlight how four types of influences (family, social-level, genetic, and assortative mating) can influence intergenerational mobility.

While Durlauf and Shaorshadze's "Intergenerational Mobility" examines how certain attitudes transmitted across generations impact social mobility, Lipset and Bendix (1959); Wilensky and Edwards (1959); Piketty (1995) focus on the reverse effect that social mobility can have on attitudes and behaviors.[1] In fact, in a qualitative study of the rise of populist parties in Europe, Loch and Norocel (2014) note that the fear of downward social mobility and loss of social status are factors that can explain the rise of the Front National in France. Other studies examine the impacts of social mobility on behavior and attitudes more broadly. For example, Tiikkaja et al. (2013) study the likelihood of psychiatric illness among one million Swedish adults by examining whether they are in a better or worse social class then their parents. Using those who were in the same social class as their parents for the control group, the authors find that adults who moved up in class were less likely to develop a mental illness.

Along the same lines, our study highlights how social mobility can influence mental health, life outlook, risk aversion, and work ethics. Our findings have important implications for policy makers, as they highlight how changes in income rather than income alone can significantly affect individual behavior, preferences, and attitudes. In fact, a more dynamic approach to understanding social mobility's influence on individuals could help solve the puzzling finding regarding the marked increase in mortality of middle-aged white non-Hispanic men and women in the United States from 1999-2013 resulting mainly from suicides and substance abuse (Case and Deaton 2015).

Lastly, the study contributes to gaining a deeper understanding of the relationship between education and social mobility. While many studies focus on the direct effect of education on social mobility (Breen and Karlson (2013); Corak (2013)), our study extends this analysis by examining the indirect effect that the education of an ancestor can have on descendants across multiple generations.

---

[1]See also Benabou and Ok (2001) and Alesina and Angeletos (2005).

3 Historical Background

French troops led by General Alfred Dodds colonized Benin, formally known as the Kingdom of Dahomey, in 1984. The country officially became colonized after Behanzin, the King of Dahomey, surrendered the kingdom's capital city to Dodds after three years of fighting. Prior to this conquest of Dahomey, Catholic missions were established in a number of towns. In some towns such as Agoue (1874) and Porto Novo (1864), missions were established in regions with an existing European presence in the form of commercial trading posts and military settlements, while other towns where Catholic missions were established, such as Zagnanado (1895), had no prior European influence.

The Roman Catholic Church's presence was mainly limited to coastal areas until after the French conquest of Dahomey, after which missions expanded to central and northern regions. According to Vatican records, the evangelization of the Slave Coast, the region between the Volta River in present-day Ghana and the Niger River in Nigeria, was one of the main priorities of the Church at the end of the 19th century. In 1861, the Church established an apostolic vicariate, a form of territorial jurisdiction, in Agoue at the border between Togo and Dahomey, but the vicariate was limited to the littoral region (see Figure A.1 in Online Appendix A). Dupuis notes that the expansion of the Catholic missions into the hinterland was difficult due to the Kingdom of Dahomey's "closed" and "impenetrable" nature (1961, p. 10). However, after the French conquest of Dahomey, missionaries started expanding the boundaries of the vicariate upwards from Agoue to the central regions of Zagnanado and Ketou. While missionaries were able to expand into central regions, French military explorers faced strong resistance in northern towns such as Atakora, Haut-Nigera, and Borgou (Report 1906). It was thus not until 1920 that the colony was completely pacified and Porto-Novo was established as the capital.

Dahomey fell under the control of two administrations, the French colonial government in Dakar and the Vatican's apostolic vicariate in Agoue, which both faced similar obstacles to expanding their influence across the territory despite having differing objectives. The French colonial government, seeking to maximize revenue, faced challenges to its rule due to sporadic armed resistances in the north. The Vatican, on the other hand, sought to maximize its religious influence but was constrained by a strong Islamic presence in the north and traditional animistic practices in the south. Despite these distinct challenges, both administrations had very limited knowledge of the

country's human resource capacity beyond coastal areas. Cultural differences played a large role in minimizing interaction between the settlers and local populations. For example, a French report highlighted the high level of hostility toward the colonial presence, its education system and cultural practices (Report (1906), pp.64-71).[2] Additionally, the lack of diversity in the occupations and living standards of the local population made inference about the local level of human capital difficult in the absence of extended interaction with the people.[3]

Given these challenges, both the Vatican and the French colonial government prioritized primary education as a precondition for successfully carrying out their "civilizing missions" (Dupuis (1961), p. 69). In fact, in towns such as Zagnanado (1895), Kandi (1911), Save (1913), and Natitingou (1922), schools were opened immediately in their respective regions following the end of the colonial war. These schools were established to train civil servants, such as translators, nurses, accountant, and security guards, to serve in the new civilian colonial administrations "or cercles", which were established 6-10 years after the first schools were opened.[4] In each case, human capital investment preceded colonial establishments.

4   Data Collection and Sampling Procedures

The data for this article comes from Wantchekon (2012), which used face-to-face interviews and archival research on the first four regional schools in Benin. Established by colonial administrators and Catholic missionaries, these schools were located in four sites: Kandi, Natitingou, Save and Zagnanado. In this section, we explain in detail the selection of (i) treated villages where the schools were set up and control villages where the schools could have been established, and (ii) treated students and their descendants of the following two generations and control children. The sampling of villages and students is based on well-founded historical counterfactuals to villages where the schools were established and children who were selected as the first cohort. In order to determine the viability of these counterfactuals, we display stability in pretreatment variables between the treated school locations and untreated villages, and for treated students and untreated

---

[2] The report states,"Unfortunately, there is among many natives, a high degree of mistrust and resentment vis-ï¿ $\frac{1}{2}$ -vis the White settlers, which proves that there is very little contact between White settlers and the Africans" (p. 102).

[3] The vast majority of the local population was subsistence farmers (see D'Almeida (1990)).

[4] Zagnanado was a Catholic school that trained both religious teachers and civil servants.

children living in near proximity of schools and those belonging to villages away from the school. Additionally, as a result of the limited information from the colonial authorities and missionaries, our selection process of both the school sites and the first students possessed a significant haphazard component.

4.1 Site Selection

The four locations examined in this study are 100 km or more from the Atlantic Coast, the southern border of the Kingdom of Dahomey. Before these schools were founded, these four places had no significant European exposure in the form of institutions, commerce, religion, or politics.[5] Meaningful influence from European institutions before the setting up of the schools would create two problems in this study. The first issue involves self-selection into schools. Coastal areas (i.e., Porto Novo, Agoue and Cotonou) had extensive interactions with European traders. Residents with some knowledge of the French language and formal education would be more capable of engaging with the European merchants. As a result, certain residents in these four areas would have self-selected into education. The second issue concerns isolating the impact of newly established schools from previous European institutions on future development results at the individual and regional level. Indeed, these areas simultaneously experienced the increased presence of European institutions and the establishment of colonial schools, which complicates disentangling the effect of education from that of colonial institutions. For these two reasons, villages within 100km of the coast were not included in this study.

The sites selected for this study had no formal educational institutions before the establishment of the colonial schools. The absence of European or other type of schools fixes the self-selection problem in which residents with more knowledge about the advantages of education were more likely to attend school.[6] Given that prior generations did not have any formal education, the children who enrolled in these schools were the first in their communities to receive an education. Against this background, the two defining traits of these sites are the following: limited or no prior European

---

[5]Dupuis (1961) wrote: "Despite being the first settlement of the "Societes des Missions Africaines" the Kingdom of Dahomey was inaccessible for Europeans. Religious conversion in the Central and Northern part of the territory became possible only after the Kingdom was conquered by the French colonial troops"(p. 10). Even after the French conquered the territory, the Europeans only knew the coastal part of territory was known, albeit imperfectly (D'Almeida (1990), p.20)

[6]See pp. 17-18 in Dupuis (1961).

economic influence and no prior formal European-style education. The four sites possessed the first regional schools in the hinterland of Benin.

4.2 Selection of Control Locations

If the treatment and control villages had different characteristics before the introduction of the colonial schools, the results could differ because of these initial disparities. As a result, for the comparison group, we identify villages that we believe were just as likely to be chosen by colonial authorities for school establishment. To select our comparison group, we rely on two mechanisms. First, we leave out villages that lie within a 6-7 km radius from the school site, as they are close enough to the schools that children from these villages could have been able to attend. The great majority from the first cohort of students had to commute to the schools every day by foot because boarding facilities did not exist. Students within the 7km radius would have had to walk three to four hours since the villages were only connected through unpaved trails.[7] We therefore conclude that children from villages outside the 7km radius were very unlikely to go to school. Our assumption is confirmed by the data from the first generation, which shows that no student living with his or her parents had to walk more than 6km to attend school.[8]

Our sample of candidates for control villages includes those within a 7-20km radius around the school. As previously mentioned, children living in villages more than 7km away would not have gone to school. Meanwhile, villages over 20km away from the schools would be so far away that they might be in another region with different geographic and ethnic traits. We thus assume that villages within the 7-20km radius from the school site could have been chosen by the colonial administration or missionaries as a viable site for a school. We confirm our assumption below by providing an example from Zagnanado (See Section 2.3). Our data indicates that the treatment and control villages had very similar geographic, ethnic, social, and political characteristics.[9] Map A.7 of Zagnanado in Section 1 of Online Appendix A displays the school at the center of the circle;

---

[7]In his 1995 publication, d'Almeida Topor argued that adults usually had to walk 10 hours or 25km from their homes to the local markets. A a result, it should take at least three to four hours for 10- to 14-year-old students to walk 7km to school.

[8] 12 students (mostly from Zagnanado) lived more than 6km away from the school. Nevertheless, school records and qualitative evidence demonstrate that those students from Zagnanado were living in a dormitory whereas those from Natitingou were living with foster families near the school (Centenaire (1995), p. 17). The six children from Zagnanado were perhaps children of villagers from Baname and Cove converted by Schenkel and Steinmetz early in 1895 during their trip back from Pira through Zagnanado (Centenaire (1995), pp. 10-14).

[9]The balanced covariate table is available upon request.

the small circle is the treatment area (6-7km from the school), and the bands are the control areas (7-20km from the school).

Within the 7-20km radius from the school, we randomly choose one control village. [10] To showcase the selection process of the control locations, we rely on current maps from the four sites (see Map C.1 in Appendix C). To the best of our knowledge, the distribution of villages in the current maps is identical to the distribution that was in place when the schools were founded. By checking colonial maps and a population census from 1931, we established that there is no evidence of the emergence of a new village or complete disappearance of a village after the setting up of the schools. In total, there are 18 potential control villages in Natitingou, 17 in Kandi, 10 in Save, and 15 in Zagnanado. In the latter case, all of our sample villages can be observed on a map issued by the missionaries in 1895 (see Maps A.1, A.2, and A.8 in Online Appendix A, Wantchekon et al. (2015)).

4.3 Illustrative Example: Zagnanado.

Catholic missionaries from the Société des Missions Africaines in Lyon built one missionary school in Agnonlin region-a province of the Kingdom of Dahomey-in 1895. After the fall of the Kingdom of Dahomey in late 1894, the missionaries increased access to the interior of Benin. As of 1895 though, the French had not yet put in place a formal colonial administration in the area.[11] The pamphlet "Centenaire de l'Arrivee des Missionaires au Pays Agonlin", which is based on diaries and reports of some of the founders of the Catholic school of Zagnanado, gives interesting insights about the process that led to establishing the school (see Map A.2 and Map A.8 in Section 1 of Online Appendix A).

At the start of 1895, two missionaries of the Société des Missions Africaines (SMA) Priests Pierre Schenkel and Francois Steinmetz (who will become Bishop Steinmetz) traveled inside the Dahomey; a journey on foot lasting more than two months which leads them from Agoue to Pira, passing by Djaloukou and Savalou. They are the first two Europeans to head to the sources of the Zou. The two priests came down from Pira through Dassa and Abomey where they diverted slightly towards the East to Agonlin, which takes two days to reach on foot from Dassa(. . .) In a

---

[10]In Save, the size of the population of the first randomly selected control village was significantly lower than in the treatment village; we selected another one at random.

[11]See Centenaire de l'Arrivee des Missionnaires au Pays Agonlin (1895-1995), pp. 10-14.

neighboring village, so much sympathy was shown towards one of the priests who was ill which was in itself unbelievable; they want him to stop his journey for some time because of his poor health and the rough roads that lay ahead of him. *Faced with his refusal to stop, they cleared and weeded out two kilometers to ease his travel. It is as a result of this trip, and based on the report and instructions of the two priests that the mission of Zagnanado was founded.* (Centenaire (1995), pp. 10-12, emphasis added).

The school opened two months after the trip, when Father Schenkel came back to the region, but this time with Michaud, not Steinmetz. Starting in the coastal city of Porto Novo, they traveled up the Oueme River and decided to stop at the small town of Sagon, right in the heart of the Agonlin-Zagnanado region. They settled in a small town by the name of Assiadji, located 5km from the left bank of the river (Centenaire (1995), p.12). Nothing in the diary shows a preference to go left instead of the right side of the river. Additionally, we could not find any evidence that there were features on the right side of the river that made it unfit for a school. In fact, in 1905, ten years later, colonial missionaries ended up setting up a school on the right side of the river in Ketou. All of these facts lead to believe that the decision to settle on the left bank of the river was arbitrary. At that time, the village of Zagnanado and the surrounding smaller settlements of Doga, Houegbo, Don, and Agnangon had a population of approximately 2,000 residents. Located within a 7km radius of the school, this cluster is part of the treatment area. We consider the 7-20km band around the school to be the control area. Sagon, Houinhi, Wakon, Agonve and Kpedekpo are some villages of the control area. Out of 15 potential control villages, Kpedekpo was randomly selected to be the control village.

From the data we gathered, we see that Kpedekpo and Zagnanado are very similar on observable factors, such as ethnic composition, political and institutional background, and distance from the port. Indeed, the only differences between Kpedekpo and Zagnanado are land fertility and mean elevation.[12]

4.4   Individual-Level Data Collection and Survey

The research design includes three groups of individuals: those who lived near and enrolled in a school (TG1), those who lived near but did not enroll in a school (TG2), and those who lived

---

[12]The balanced covariate table is available upon request.

outside the radius of the school (C). Researchers from the Institute for Empirical Research in Political Economy (IERPE) in Benin collected data on these individuals in three phases. During Phase 1, researchers identified the first two cohorts of students from colonial schools (TG1) and a sample of their unschooled peers (TG2, C) at four sites (Kandi, Natitingou, Save, and Zagnanado) using school, colonial, and family archives, as well as in-person interviews of local informants. In Phase 2, informants with close ties to subjects identified in Phase 1 were asked to complete social and demographic surveys. Finally, Phase 3 consisted of demographic and behavioral surveys of third-generation descendants of subjects identified in Phase 1. The survey questionnaire (see the appendix) covers the standard questions on risk aversion, optimism and mental health. Additional details regarding data collection, survey logistics, and measures taken to ensure the reliability and credibility of data are provided in Appendix A.

4.5 Sampling and Archival Sources

The research team used extensive archival sources, mainly school records, colonial administration records (e.g., ID cards), and family archives, to identify the individuals in the three groups described above and their descendants. These sources enabled researchers to identify the names of the treated individuals and the first cohort of students, to determine several relevant variables, and to adjudicate conflicting information provided by the informants. Researchers located student records for individuals in TG1 for two of the four selected schools: Zagnanado's Catholic school and the public school in Natitingou. Because Zagnanado had a Catholic school, the Church preserved its records. Additionally, researchers were able to locate information from the Société des Missions Africaines in Lyon, France. School officials (a priest in Zagnanado and French civil servants in other locations) created the archives, which were kept either at the school or at the home of the principal.[13] These records include information on the students, such as their names, an evaluation of their academic performance, and their parents' names and professions.[14] Records for the school in Save were incomplete, but the research team was able to locate several family archives. In Kandi, the school had no archives of student records, thus researchers relied primarily on colonial

---

[13]The IERPE research team located the student records in Zagnanado at the home of Mr. Aihounton, a former principal at the school, who took it from the school when it was closed in 1975 by the military government.

[14]Documents III and IV in the Online Appendix show photographs of the first two cohorts of the Zagnanado school and its founders.

administrative archives and face-to-face interviews of individuals (Lafia N'Gobi Gouda and Demon Komkom) who were born around 1916 and knew the students relatively well. They also relied on a monograph written by former Kandi students on the history of the school.

Given that there were no school archives for unschooled subjects in treatment and control villages TG2 and C, respectively, researchers used a backward sampling intended to identify individuals in these groups. Enumerators were sent to these sites to systematically sample from village inhabitants aged 40 or above. They selected a random starting point from the sampling frame and then chose households at regular intervals (e.g., fifth, tenth, fifteenth) to select individuals. To be in the final sample, an individual had to be at least 40 years old, and their father or grandfather had to be close in age to students from the regional school. In order to identify subjects, selected individuals were asked to identify their predecessors. The individual became a subject if the predecessor was from the same age cohort as those of the treatment group. We do not include data on the selected individual, however, if his predecessor was from a different age cohort. While this type of sampling of untreated individuals may raise concerns about potential bias-given the relationship between social status and the probability of being sampled-, we believe these issues are minor for several reasons. First, although there might be a risk of oversampling the wealthy because they have more descendants or because they may migrate more often, low levels of pretreatment inequality in social status and a low tendency to migrate mitigate these concerns. Second, any sampling bias is likely to attenuate our results. Researchers also used available colonial and family archives, along with face-to-face interviews, to verify information on the subjects. Colonial administration archives are kept at current local government offices, as colonial districts from the late colonial period became sub-prefectures or communes that are now the sites of Benin's local governments. The IERPE research team also collected information about subjects through photo archives provided by their families. These archives sometimes included information about subjects' assets, such as houses, bicycles, and clothing. For example, Documents VII and VIII in the Online Appendix show a subject from Save in a colonial-style dress in his house. Photos sometimes included private family correspondence that provided indication of subjects' social status and political views. The availability and quality of the photo archives resembled that of the school records, with Zagnanado and Natitingou having more robust archives, while Save's and Kandi's were relatively lacking. To account for the variation from one site to another, more field researchers visited Kandi and Save,

and the interviews of the informants in these regions were much longer than those in Zagnanado and Natitingou.

4.6 The Survey

Besides the archives, field researchers gathered data via questionnaires given to local respondents and the third generation descendants from the first cohort of students and their unschooled counterparts. The first round of questionnaires was administered to local respondents who were either informants (the primary sources of information), or counter-informants, who served to cross-validate the information given by the informants. All respondents surveyed have close familial or personal ties to the original students or the students' unschooled contemporaries.

Children, grandchildren, siblings, and neighbors comprised the pool of respondents for the questionnaire regarding the first generation. They were surveyed to determine the personal characteristics and ties to the subject. When several informants were available, we gave preference to the oldest (in terms of age) or the informant closest to the subject. Unless the informant was not lucid, the oldest informant would most likely have more reliable information than younger ones since she or he probably interacted more with the subject than his or her younger counterpart.

To determine the quality and the reliability of the data provided by the informants, another questionnaire was administered to informants. The questionnaire covered questions about the nature and time span of their relationship with the subject. In each location, a number of counter-informants were asked to corroborate the informants' data. A set of questions in the informant questionnaire was posed to counter-informants to check whether the responses of these two groups matched.

In addition to surveys on first and second generations, a third survey was administrated on the third generation: grandchildren of subjects from TG1, TG2 and C. The survey covered the basic social demographic such as age, gender and income. It also covered risk and time preference, work ethics, life outlook and mental health. More specifically, one section of the survey captured perceptions of social risk by giving subjects a list of actions and hypothetical scenarios. Action questions included driving at high speeds on rough roads (S1.Q14), walking home alone in a dangerous area (S1.Q10), driving a motorcycle without a helmet even though it is enforced by the law (S1.Q15),

13

and denouncing a neighbor or a friend for illegal activity (S1.Q20).[15] We also gave respondents some hypothetical scenarios with specific set of questions. For example, we asked respondents several questions regarding two job option scenarios, one with a fixed salary and one with a variable amount that could lead to both higher and lower earnings in comparison to the first option. In addition to this scenario, we asked questions about trust; the level of trust towards his or her community, parents, neighbors, and other people he or she does not know.

As for risk preference, respondents were asked for example whether they preferred to receive a certain amount of money in a month, or a higher amount in seven months. The third section of the survey covered the extent to which respondents agreed or disagreed with a list of statements regarding attitudes toward work, such as intrinsic motivation and collegiality, and corruption.

Finally, we asked questions about mental health and life outlook. Respondents' mental health was captured through questions such as sense of loneliness, depression sleeplessness, whereas their life outlook was recorded through questions about perceptions of social mobility and life satisfaction, personal ambition and optimism (See details on the survey logistics and measures of data reliability in Appendix A).

4.7 Data Credibility

Measuring the credibility and the reliability of the information collected from informants constituted a major challenge in the data collection process. Criteria for establishing credibility relied on the extent of previous interactions between the respondent and the subject, with particular attention paid to the nature of the relationship and the time span of the interaction. For example, researchers preferred family members to informants from outside the family such as neighbors or friends. However, given that most informants were family members, credibility also depended on distance and length of interactions with the subject. As a result, preference was given to older respondents who were more likely to have known the subject for a longer period of time. Furthermore, because distance was a relevant criterion, children or siblings who had lived with the subject were preferred to those who had not lived with the subject or who had but for a shorter time.

In order to measure reliability of the information, two strategies were employed: demanding

---

[15]Each action had three categories of questions: (a)...are you likely to adopt the behavior? (b)...do you think the action is risky? (c)...do you think the action is beneficial? These questions had four response options that ranged from "not at all likely' to "very likely". The fourth option was "I don't know".

supplementary data from informants and using counter-informants. For the first strategy, informants were asked to provide additional proof for every piece of information provided. For example, physical data in the form of photos of the subject or documents pertaining to the subject constituted the most reliable form of proof. If this data was not available, researchers prioritized respondents who had lived with the subject for a significant amount of time. The second strategy, using counter-informants who were selected to answer the same questions posed to the original informants with supporting evidence if possible, aimed to verify there was no mismatch between data provided by informants and counter-informants. Based on this strategy, information provided by informants was considered reliable if confirmed by counter-informants. In the case of a mismatch in information, preference was given to information provided by the closest informant (Appendix A provides additional details).

Overall, data credibility was established using the following information hierarchy. Top priority went to archival evidence, followed by physical data such as photos or assets such as the subject's actual house. If archival evidence was lacking, preference was given to information given by a subject and verified by a counter-informant. Based on the information displayed in Table A3.1 in Appendix A, the best-matched variables are housing (78.65%), means of transportation (63.77%), dressing style (82.68%), and profession (49.81%).[16] If a mismatch occurred, information from the respondent who resided with the informant for longer time was given a greater weight. Section A3 in Appendix A displays the descriptive statistics of the credibility measures of the variable.

5   Measures of Mobility

A number of measurements exist to evaluate intergenerational mobility. The measurements can be broadly categorized into the sociological or economic literature (Torche 2015). Sociologists prioritize occupational measures over earnings and income based measures of mobility. They usually rely on occupations that they rank into a one-dimensional status hierarchy or collapse into aggregated classes. Occupational status is operationalized as a weighted average of the mean level of earnings and education of particular occupations (Torche 2015). Another method that sociologists rely on for analyzing intergenerational mobility is class mobility. This measurement categorizes classes

---

[16]Given the absence of birth certificates and maternity hospitals prior to the establishment of the colonial administration, birth dates are not well matched (30.54%).

into groups based on particular occupational assets that influence life opportunities such as income, health and wealth Grusky and Weeden (2006), and which are shaped by economic and institutional factors (i.e., technological change, welfare and labor market policy), Breen and Whelan (1996). Both of these measurements, occupational status and class mobility, have been extensively used to analyze the mediating role of education in social mobility.

There are a number of limitations to the sociological approach. Regarding occupational status, the literature often does not report the distribution of occupational status. This happens because they assume normality or that the intergenerational regression coefficient is not influenced by departures from this assumption.[17] As for the measurement of class mobility, researchers disagree as to which unit of analysis yields the most accurate results of class mobility. Advocates of class analysis argue that the family constitutes the main unit of analysis Erikson and Goldthorpe (1992), though other alternatives have been suggested such as a combination of the class positions of spouses, the class position of the father/husband, or the class position of the spouse with the higher-class position or labor market engagement (Torche 2015).

Economists tend to focus on earnings mobility, also known as the intergenerational income elasticity (IGE), which examines "[. . .] the intergenerational association by means of a linear regression of the log-transformed measure of parents' and children's earnings, or the percentile rank of these respective earnings.[18]

The log-transformed measure mitigates the strong right skew of earnings distribution. As a result of the double-log formulation, the elasticity of the regression coefficient ends up measuring the average percent change in children's earnings associated with a one percent change in parental earnings (Torche 2015). As the measurement evaluates the association with percentages, it is able to adjust for economic contraction and growth over time. The elasticity, then, is a measurement of relative mobility, not absolute. It should be mentioned that the intergenerational elasticity is influenced by the degree of earnings inequality in each generation and its change across generations. Most often, empirical values of elasticities are between 0 and 1, though they might take higher values (larger than 1) if earnings dispersion across generations dramatically increases (Torche 2015).

---

[17]Their assumption might cause problems however if the population under analysis has kinks in its distribution. Additionally, the sociology literature has not made use of the economic mobility camp's insights, which demonstrate that comparing regression coefficients across groups can lead to a flawed assessment of mobility (Torche 2015).

[18]Florencia Torche. "Analyses of Intergenerational Mobility An Interdisciplinary Review." The ANNALS of the American Academy of Political and Social Science 657, no. 1 (2015): 44.

Given the nature of our data and our focus on the direction of social mobility, we opt to measure mobility by using transition matrix together witj a standard ordered logit model. The measure of intergenerational earnings elasticity/rank coefficient has been found to have three sources of bias: (1) transitory (and auto correlated) fluctuation around long-run income; (2) life cycle bias, and (3) age-related errors in variable bias (Jenkins (1987); Mazumder (2005); Black and Devereux (2011)). Measurement errors resulting from these three biases have mostly been addressed by relying on administrative data, such as social security and tax data. An alternative to reduce measurement error is the use an instrumental variable approach - in other words, a variable unrelated to measurement error, but related to parents' earnings must be found (Torche 2015).

5.1 Methodology

To measure social mobility, we construct a variable that relies on data from third generation (grandchildren of the first cohort of students) individuals. While our measure of social mobility between the first and second generations uses a wealth composite comprising of income, housing quality, individual and family assets, among others, only the monthly income was available for the third generation.

Using this information, we measure social mobility from the second to the third generation in three steps. First, we estimate an ordered logistic model to capture the probability of moving from a continuous wealth scale to one of the three following income groups: low-income (below 70,000 CFA per month), middle-income (between 70,000 CFA and 500,000 CFA per month), and high-income (above 500,000 CFA per month). Second, we compute the marginal effect of moving from the wealth scale to one of the three income categories. Third, we multiply this marginal effect (`mfx`) by the gap between the second and third generation incomes, or the difference between children and parent status (`gc_parent_change`). Social mobility (`mfxchange1`) is thus represented by `mfxchange1=mfx*gc_parent_change,` where a negative value of mfxchange 1 indicates that an individual from the third generation moved up on the wealth scale compared to the parent. Conversely, a positive value implies that a child moved downward on the wealth or education scale.

6 Empirical Analysis

In this section we present the results of our econometric analysis. We provide evidence for upward education mobility for both the second generation and third generation, and upward income mobility for the second generation and downward income mobility for the third generation. We also establish the relationship between income mobility and a number of behavioral outcomes, and use an IV strategy to show the causality of this relationship. In each case, we provide transition matrices that describe the probability of mobility from one generation to the next one and and the ordered logistic model that provides a more formal measure of mobility.

For the transition matrices, the predicted probability is estimated with an ordered logistic model of the following form:

$$Y_{i,k} = \beta * Y_{i,k-1} + \epsilon_i \tag{1}$$

where $Y_{i,k}$ is the wealth scale of individual i from the $k - th$ generation, where $k = 2, 3$, and $Y_{i,k-1}$ is the wealth scale from the previous generation. From this model we obtain the predicted probabilities of the latter generation after computing an ordered logistic model, where the predicted probabilities take the form of:

$$Pr(Y_k = j) = Pr(q_{j-1} < \alpha * Y_{k-1} < q_j) \tag{2}$$

Where $Pr(Y_k = i)$ is the predicted probability that the wealth of the $k - th$ generation equals to the outcome j, where j is the number of possible response categories for the dependent variable ($j = 1, ..., 5$), q_{j-1} and q_j are the cut points, α is an estimation parameter and Y_{k-1} is the wealth status of the previous generation, the $(k - 1) - th$ generation, where $k = 2, 3$. The same exercise is used for the education transition matrices.

Then, the basic specification for social mobility ordered logistic model is as follows:

$$Y_{i,k} = \beta * X_{i,k}\beta + Y_{i,k-1}\gamma + \epsilon_i, \tag{3}$$

where $Y_{i,k}$ stands for the scale of the $k - th$ generation, ($k = 2, 3$), $Y_{i,k-1}$ is the scale for the $k - 1$

generation and X_i, k is a set of control variables specific to the $k-th$ generation. For this ordered logistic model, the independent variables are composites of parents' and/or grandparents' income, gender, profession, and treatment status. This ordered logistic regression is implemented for both education and wealth scales. The results are presented below.

6.1 Second Generation Results

6.1.1 Education

Table I from Wantchekon et al. (2015) (p. 723) indicates that individuals from the first generation either attended school, and in that case they did not go beyond primary school, or they did not attend school. Thus grandparents in our sample are either not educated at all (0) or have only primary education (1). The second generation, however, is either non-educated (0) or has primary to University education (1-3). Table 6.1 A presents the transition matrix.

Table 6.1 A – Transition Matrix of Education between First and Second Generations

		Second Generation Education			
		0	1	2	3
First Generation Education	0	56.37%	25.13%	14.54%	3.96%
	1	31.24%	29.54%	28.74%	10.48%

The table shows that about 30% of descendants of educated parents did not have primary school education, and about 20% attended secondary school. As for the descendants of unschooled parents, all did better than their parents with up to 40% doing strictly better.

Tables I and VII from Wantchekon et al. (2015) presents the summary statistics on a number of other outcomes of the second generation (occupation, assets, and social networks). The most spectacular improvement is by descendants from treatment group 2, those who lived in a village with a colonial school but did not attend the school themselves. For instance, they have 52% a primary school enrollment rate as opposed to 0% for their parents. Only 10% of the individuals became farmers, as opposed to 78% of their parents. Indeed, they nearly caught up with the descendants of individuals from the treatment group (received primary education). These results, (Wantchekon et al. 2015) suggest that aspiration and role models are a possible mechanism driving this impressive upward mobility (741).

Table 6.1 B – Ordered Logit of First to Second Generation Education: Odds Ratio

VARIABLES	(1) Odds-Ratio	(2) Odds-Ratio	(3) Odds-Ratio
Second generation Education Scale			
Second generation Wealth Scale	2.810***	2.610***	2.624***
	(0.0920)	(0.0878)	(0.0960)
Individual-level treatment		1.501***	1.014
		(0.135)	(0.104)
Village-level treatment		1.727***	1.800***
		(0.181)	(0.212)
First generation Wealth Scale			1.465***
			(0.0548)
Constant cut1	9.385***	13.35***	33.62***
	(0.817)	(1.384)	(4.991)
Constant cut2	47.62***	70.11***	187.8***
	(4.967)	(8.565)	(31.31)
Constant cut3	422.4***	640.3***	1,806***
	(55.77)	(93.58)	(353.4)
Observations	2,797	2,797	2,498

Robust Seeform in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table 6.1 C – Ordered Logit of First to Second Generation Education: Marginal Effects

VARIABLES	Category			
	0	1	2	3
Second generation Wealth Scale	-0.238***	0.0936***	0.123***	0.0215***
	(-0.00901)	(-0.00742)	(-0.00658)	(-0.00184)
Individual-level treatment	-0.00338	0.00132	0.00175	0.000306
	(-0.0254)	(-0.00994)	(-0.0132)	(-0.00231)
Village-level treatment	-0.146***	0.0653***	0.0687***	0.0116***
	(-0.0289)	(-0.0151)	(-0.0125)	(-0.00226)
First generation Wealth Scale	-0.0942***	0.0370***	0.0487***	0.00851***
	(-0.00925)	(-0.00449)	(-0.00514)	(-0.00101)
Observations	2498	2498	2498	2498

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

6.1.2 Income

In regards to income, Wantchekon et al. (2015) constructed a living standards scale based on a factor analysis using several indicators such as housing quality, land and shop ownership, household equipment, means of transportation, travel patterns, household equipment, access to clean water and access to electricity. The scale was created for Generation 1 and 2. Table IX (p, 735) clearly indicates a positive correlation between the income scale of generation 1 and that of generation 2. This is not at all surprising given the strong correlation between education and wealth, and educational mobility of generations 1 and 2.

Table 6.1 D – Transition Matrix of Income Category between First and Second Generations

		Second Generation Income Category		
		1	2	3
First Generation Income Category	1	65.95%	21.43%	12.62%
	2	52.51%	27.30%	20.19%
	3	38.69%	30.60%	30.72%

Table 6.1 E – Ordered Logit of First to Second Generation Wealth: Odds-Ratio

VARIABLES	(1) Odds-Ratio	(2) Odds-Ratio	(3) Odds-Ratio	(4) Odds-Ratio	(5) Odds-Ratio	(6) Odds-Ratio	(7) Odds-Ratio
First generation Wealth Scale	1.377***	1.037	1.037	0.968	0.968	1.037	1.037
	(0.0394)	(0.0330)	(0.0330)	(0.0341)	(0.0341)	(0.0330)	(0.0330)
Second generation Wealth Scale		4.051***	4.051***	3.764***	3.764***	4.051***	4.051***
		(0.190)	(0.190)	(0.180)	(0.180)	(0.190)	(0.190)
Individual-level treatment				1.456***	1.456***		
				(0.143)	(0.143)		
Village-levelt treatment				1.977***	1.977***		
				(0.196)	(0.196)		
Constant cut1	1.268***	1.422***	1.422***	2.047***	2.047***	1.422***	1.422***
	(0.104)	(0.126)	(0.126)	(0.225)	(0.225)	(0.126)	(0.126)
Constant cut2	3.844***	5.901***	5.901***	8.878***	8.878***	5.901***	5.901***
	(0.330)	(0.545)	(0.545)	(1.015)	(1.015)	(0.545)	(0.545)
Constant cut3	7.667***	15.45***	15.45***	23.81***	23.81***	15.45***	15.45***
	(0.702)	(1.541)	(1.541)	(2.902)	(2.902)	(1.541)	(1.541)
Constant cut4	30.12***	92.39***	92.39***	145.4***	145.4***	92.39***	92.39***
	(3.389)	(11.92)	(11.92)	(21.24)	(21.24)	(11.92)	(11.92)
Observations	2,516	2,498	2,498	2,498	2,498	2,498	2,498

Standard Seeform in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table 6.1 F – First to Second Generation Marginal Effects for Income

VARIABLES	Category				
	1	2	3	4	5
Second Generation Wealth Scale	-0.0858***	0.0316***	0.0385***	0.0127***	0.00292***
	(0.0127)	(0.00537)	(0.00593)	(0.00209)	(0.000648)
Third Generation Education	-0.252***	0.0928***	0.113***	0.0374***	0.00858***
	(0.0102)	(0.00851)	(0.00686)	(0.00313)	(0.00142)
Individual-level treatment	-0.00928	0.00339	0.00419	0.00138	0.000318
	(0.0224)	(0.00814)	(0.0101)	(0.00335)	(0.000771)
Village-level treatment	-0.0466	0.0185	0.0201	0.00649	0.00148
	(0.0299)	(0.0128)	(0.0124)	(0.00399)	(0.000944)
Observations	2,139	2,139	2,139	2,139	2,139

Robust Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

There is, overall, significant upward mobility from the first to the second generation on education and living standards, and occupational diversity. This could be attributed to the rapid growth of both the public and private sectors and to colonial investment in the country, particularly around the location of the schools.

6.2   Third generation

As before, we will provide evidence for mobility, downward or upward on both education and income. Education for the third generation is classified into 5 categories ranging from primary school or no education (0), secondary school (1), high school (2), college (3), to graduate school (4). As mentioned above, the second generation education categories range from no education (0), primary school (1), secondary or high school (2), and college (3).

Table 6.2 G – Transition Matrix, Education Outcomes from Second to Third Generation

		Third Generation Education				
		0	1	2	3	4
Second Generation Education	0	56.54%	34.80%	6.26%	2.24%	0.16%
	1	11.68%	40.05%	28.77%	17.94%	1.57%
	2	1.33%	8.49%	19.72%	56.91%	13.54%
	3	0.14%	0.96%	2.99%	35.26%	60.65%

Note: Computed using Ordered Probit Regressions.

Overall, these results show an impressive overall mobility between second and third generation

particularly for those whose parents have high school or college education (about 75% of the second generation's descendants are better educated than they are). This trend of upward mobility, though present, is less strong for those with primary education or less. Only 40% of their children are doing better than their parents. We also note that college and graduate school is only attended by the descendants of those with at least a high school degree.

We now turn to the Logistic regression to analyze social mobility between the second and third generation.

To interpret the effect of the second generation on the third generation, we calculated the marginal effects of the scale variable. The coefficient of an ordered logit provides a change in the odds ratio of one variable changing over the dependent variable. An easier way to understand it is by calculating the marginal effects. The results are presented in Table 6.2 I and confirm the findings presented in the transition matrix.

Table 6.2 H − Ordered Logit Model of Education Mobility: Odds Ratio

VARIABLES	(1) Odds-Ratio	(2) Odds-Ratio	(3) Odds-Ratio
Parent Education Scale	10.82***	10.40***	10.29***
	(0.782)	(0.769)	(0.998)
Parent Wealth Scale	1.349***	1.257***	1.257***
	(0.0781)	(0.0772)	(0.0772)
Grandparent Education Scale		1.352***	1.326**
		(0.0761)	(0.176)
Grandparent*Parent			1.012
			(0.0706)
Individual-level treatment	0.764***	0.672***	0.672***
	(0.0766)	(0.0703)	(0.0703)
Village-level treatment	2.252***	2.207***	2.208***
	(0.276)	(0.279)	(0.280)
Constant cut1	47.53***	46.71***	46.01***
	(8.485)	(8.604)	(9.416)
Constant cut2	376.2***	372.5***	366.7***
	(79.88)	(81.37)	(87.72)
Constant cut3	1,440***	1,451***	1,430***
	(305.5)	(316.0)	(334.5)
Constant cut4	22,948***	24,487***	24,254***
	(-6,610)	(-7,264)	(-7,351)
Observations	2,139	2,099	2,099

Robust standard errors in parentheses
*** p< 0.01, ** p< 0.05, * p< 0.1

Note: The coefficient of Parents education consistently shows a positive impact on the third generation education (positive since the odds ratio is higher than 1)

Table 6.2 I – Ordered Logit Model of Education Mobility: Marginal Effects

Post estimation results: Marginal Effects

Panel A: Model (1)					
VARIABLES	1	2	3	4	5
Parent Education Scale	-0.488***	0.0549***	0.266***	0.155***	0.0121***
	(0.0171)	(0.0212)	(0.0120)	(0.0104)	(0.00195)
Parent Wealth Scale	-0.0614***	0.00691**	0.0335***	0.0194***	0.00152***
	(0.0119)	(0.00297)	(0.00664)	(0.00388)	(0.000368)
Individual-level treatment	0.0559***	-0.00806*	-0.0296***	-0.0169***	-0.00132**
	(0.0211)	(0.00438)	(0.0109)	(0.00617)	(0.000525)
Village-level treatment	-0.182***	0.0555***	0.0808***	0.0424***	0.00324***
	(0.0291)	(0.0145)	(0.0115)	(0.00568)	(0.000668)
Observations	2,139	2,139	2,139	2,139	2,139
Panel B: Model (2)					
Parent Education Scale	-0.483***	0.0632***	0.262***	0.147***	0.0108***
	(0.0175)	(0.0214)	(0.0122)	(0.0100)	(0.00179)
Parent Wealth Scale	-0.0471***	0.00617**	0.0256***	0.0144***	0.00105***
	(0.0127)	(0.00265)	(0.00695)	(0.00393)	(0.000323)
Grandparent Education Scale	-0.0622***	0.00813***	0.0337***	0.0189***	0.00139***
	(0.0116)	(0.00308)	(0.00648)	(0.00368)	(0.000350)
Individual-level treatment	0.0838***	-0.0146**	-0.0435***	-0.0240***	-0.00175***
	(0.0225)	(0.00598)	(0.0113)	(0.00617)	(0.000535)
Village-level treatment	-0.178***	0.0565***	0.0787***	0.0401***	0.00286***
	(0.0301)	(0.0151)	(0.0118)	(0.00569)	(0.000618)
Observations	2,099	2,099	2,099	2,099	2,099

Standard errors in parentheses
*** p< 0.01, ** p< 0.05, * p< 0.1

Note: Each column represents how a change in the variable of interests affects the probability of the dependent variable exhibiting a specific value. For instance, as the parent education increases, it becomes less likely that third generation is reported as 1 and it becomes more likely to have a higher level of education. As the parent scale goes up, it becomes more likely to be in the higher levels of education (3, 4 and 5, respectively)

As Table 6.1 B indicates, the Odds-Ratio is greater than one in all specifications, which that there is a positive correlation between the education scale of the second generation and education mobility of the third generation. The marginal effects presented in 6.2 I indicate that conditional on being at the lowest education level, the probability of that the descendants staying declines. The probability of moving up is positive, but declines at higher education levels.

6.2.1 Income Mobility

We now turn to income mobility between the second and third generations. We have created three categories of income for the second generation and five income categories for the third generation. We first present the transition matrix:

Table 6.2 J – Transition Matrix, wealth Outcomes from Second to Third Generation

		Third Generation Income Category				
		1	2	3	4	5
Second Generation Income Category	1	56.74%	27.23%	10.26%	4.24%	1.53%
	2	51.54%	25.16%	15.05%	6.04%	2.20%
	3	46.94%	26.97%	15.95%	8.35%	1.79%

Note: Computed using Ordered Probit Regressions.

Table 6.2 K – Ordered Logit Model of Wealth Mobility: Odds-Ratio

VARIABLES	(1) Odds-Ratio	(2) Odds-Ratio	(3) Odds-Ratio
Second Generation Wealth Scale	0.351***	0.395***	-0.00387
	(0.0518)	(0.0554)	(0.0622)
Third Generation Education	1.031***	1.019***	0.780***
	(0.0420)	(0.0429)	(0.0455)
Standardized values of (income)		-0.0645	-0.146***
		(0.0456)	(0.0480)
First * Second Generation Wealth			0.926***
			(0.0388)
Individual-level treatment	0.0380	0.0753	-0.588***
	(0.0918)	(0.0969)	(0.107)
Village-level treatment	0.189	0.193	0.551***
	(0.121)	(0.125)	(0.133)
Constant cut1	2.852***	2.938***	3.468***
	(0.177)	(0.193)	(0.200)
Constant cut2	4.600***	4.673***	5.638***
	(0.196)	(0.211)	(0.223)
Constant cut3	6.170***	6.248***	7.915***
	(0.219)	(0.232)	(0.274)
Constant cut4	7.927***	8.029***	10.10***
	(0.282)	(0.297)	(0.347)
Observations	2,139	2,025	2,025

Standard errors in parentheses
*** p< 0.01, ** p< 0.05, * p< 0.1

As is apparent, there is a high amount of downward mobility, and it clear that wealth status of the parent does not have an impact on whether or not the third generation achieves upper-middle or upper-class status. Only 48.5 % of the descendants of middle income parents are middle class or

above, which means that 51 % experienced downward mobility. Remarkably, up to 75% of children from middle income parents are either low or middle income. Now we repeat the probit analysis for income mobility using the same process as was used above for education mobility.

Table 6.2 L – Ordered Logit of Second to Third Generation Wealth: Marginal Effects

VARIABLES	Category				
	1	2	3	4	5
Second Generation Wealth Scale	0.000896	-0.000359	-0.000461	-6.72e-05	-8.89e-06
	(0.0144)	(0.00577)	(0.00740)	(0.00108)	(0.000143)
Third Generation Education	-0.181***	0.0724***	0.0928***	0.0135***	0.00179***
	(0.0106)	(0.00765)	(0.00618)	(0.00189)	(0.000384)
Standardized values of (income)	0.0337***	-0.0135***	-0.0173***	-0.00253***	-0.000335**
	(0.0111)	(0.00458)	(0.00577)	(0.000904)	(0.000133)
First * Second Generation Wealth	-0.214***	0.0859***	0.110***	0.0161***	0.00212***
	(0.00897)	(0.00780)	(0.00693)	(0.00203)	(0.000462)
Individual-level treatment	0.138***	-0.0611***	-0.0664***	-0.00953***	-0.00126***
	(0.0252)	(0.0123)	(0.0120)	(0.00212)	(0.000366)
Village-level treatment	-0.132***	0.0648***	0.0584***	0.00812***	0.00107***
	(0.0326)	(0.0186)	(0.0127)	(0.00201)	(0.000329)
Observations	2,025	2,025	2,025	2,025	2,025

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

As we mentioned earlier, the odd ratios of less than one indicates a negative correlation between wealth scale of second generation and upward mobility in the third generation. The marginal effects are negative and but not significant.

7   Exploring Plausible Mechanisms: Treatment Status and Public Sector Employment

Given that we observe a high degree of upward mobility with regards to education, but downward mobility in terms of income, we conclude that there has been a sharp decline in the return to human capital between the second and third generations. Below we will examine two possible explanations of downward mobility for the second generation. First we examine the treatment status of the grandparents and its mitigating effect on the downward mobility of the third generation. Second, we examine the role of public sector employment and public sector wages as another contributing factor to this trend.

To establish these results, we first present a summary statistics on income scale by employment status, if it is whether private or public. We also estimate the following econometric model

$$Y_i = \beta * priv + \eta * educ_i + \delta * IT_i + \delta * VT_i + \varepsilon_i \tag{4}$$

where Y_i is the wealth scale of the $i-th$ individual from the third generation, $priv$ is a dummy variable taking the value of 1 if the individual is employed in the private sector and 0 if he is employed in the public sector, $educ_i$ is the education scale level of the $i-th$ individual from the third generation, IT is is the individual level treatment variable, VT the village level treatment variable and ε_i is the robust error term.

7.1 Treatment Status

Table 7.1 A $-$ Income Scale by Sector/Education

	Education scale					
	1	2	3	4	5	Total
Public	1.557	2.131	2.608	3.000	3.152	1.958
St. Dev.	0.756	0.980	1.047	0.932	1.145	1.101
No. Obs.	440	282	181	335	79	1850
Private	1.209	2.145	1.712	3.118		1.768
St. Dev.	0.608	1.028	0.779	1.409	0.000	0.987
No. Obs.	540	716	260	34	0.000	1550
Total	1.365	2.141	2.079	3.011	3.152	1.905
	0.700	1.014	1.000	0.984	1.145	1.068
	980	998	441	369	79	3559.000

Tables 6.2 I and Table 6.2 K (above) examine the effect of village and individual level treatments on the income and education mobility of the third generation. The results indicate that individuals whose grandparents either received schooling from a colonial school or lived in a village with a colonial school experienced less downward mobility than their counterparts whose grandparents did not live in a village with a school. However there was no such difference between individuals whose parents attended school and individuals whose grandparents lived in a village with a school but did not receive an education. In regards to the likelihood of downward mobility, by the third generation, those whose parents did not receive schooling had caught up with those whose grandparents did receive an education.

7.2 Public Sector Employment

Table 7.1 A presents the sample's education scale by sector. It indicates that a large majority (64 %) of individuals with secondary school or less work in the private sector, while a large majority (69%)of individuals with high school education or more work in the public sector. With regards to income, individuals with low education tend to earn less than their counterparts in the public sector, while the opposite is true for those with high education (see Tables 7.2 C and A17).

Table 7.2 B – Income Scale by Occupation

Public Sector Employees with at Least High School Education

Occupation	N	mean	St. Dev.	min	max	Proportion in Income Scale 1 or 2
Accountant / Manager / Cashier	62	3.29	0.86	2	5	21.0
Agricultural Engineer / Structural Engineer	10	3.80	1.03	2	5	20.0
Commercial Agent	14	2.71	1.07	1	4	42.9
Communicator / Journalist	10	3.50	0.85	2	5	10.0
Construction Industry/ Civil Engineering	25	3.12	0.97	1	5	28.0
Customs Officer	2	3.50	0.71	3	4	0.0
Dev Consultant	9	3.44	1.51	1	5	33.3
Diplomat	1	5.00	.	5	5	0.0
Doctor	4	3.50	1.73	1	5	25.0
Economist	11	3.36	1.21	1	5	27.3
Forester	3	3.33	0.58	3	4	0.0
Geographer	2	3.00	1.41	2	4	50.0
Hotelier	8	2.63	1.41	1	5	50.0
Lawyer	6	3.67	0.52	3	4	0.0
Magistrate	3	3.33	1.15	2	4	33.3
Microfinance Agent / Banker	9	4.11	1.05	2	5	11.1
Midwife	13	2.69	0.75	1	4	30.8
Nurse / Med School	23	2.61	0.72	2	4	52.2
Other	2	1.50	0.71	1	2	100.0
Priest / Religious	11	1.73	0.90	1	4	90.9
Professor	23	3.09	0.85	1	4	21.7
Unemployed	531	1.15	0.53	1	5	97.6
Radiologist / Dispensary Technician	14	3.43	1.16	2	5	28.6
Taxes Agent	2	3.00	0.00	3	3	0.0
Teacher	139	2.80	0.78	1	4	30.9
Veterinary / Logger / Framed	10	3.30	0.95	2	5	20.0
Total	947	1.35	0.53	1	5	67.90

Table 7.2 B (see below) indicates that the average income scale is 1.5, which is clearly in the low income bracket. Remarkably, a number of traditionally middle class or upper middle class professionals such as nurses and teachers are now in low income brackets (1 or 2) which means

Table 7.2 C

Education = 2, 3, 4, or 5

VARIABLES	(1) Highschool or more	(2) Highschool or more	(3) Highschool or more
Private Sector	0.201***	0.168***	0.154***
	(0.0485)	(0.0547)	(0.0527)
Child Education Scale		0.0389	0.0498*
		(0.0301)	(0.0294)
Individual-level treatment			-0.510***
			(0.0508)
Village-level treatment			0.235***
			(0.0733)
Constant	-0.551***	-0.642***	-0.683***
	(0.0338)	(0.0779)	(0.0916)
Observations	1,350	1,350	1,350
R-squared	0.013	0.014	0.083

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

that they are earning less than 70,000 CFA a month (note that the minimum wage is 35,000 CFA). In addition, professions known to have a high level of corruption such as customs and tax officers are in middle or high income categories, with an average of 3.5. Thus, the data suggest that one possible driver of downward mobility is a decline in real wages of civil servants.

8   Behavioral Effects of Mobility

As we mentioned earlier, a significant contribution of this paper is that it examines the behavioral effects of social mobility. This is important because it might help explain how social mobility impacts development, a question that has been largely ignored by the literature. Upward social mobility in the aggregate is equivalent to development, but this paper aims to deconstruct the aggregate and focus on the individual in order to shed light on the behaviors conducive to development.

More specifically, social mobility can be the link to understanding individual behavioral capacity for development, such as risk and time preferences can help explain investment decisions, demand for education, and entrepreneurship. In this paper, we explore the effects of social mobility on several individual behavioral measures. Specifically, we are interested in the effects of social mobility on risk aversion (social, physical and financial), mental health, self-reliance, cynicism and work ethic.

Table 8.0 A – Effect of Mobility on Risk Aversion

| | (1)
Social Risk
Aversion | (2)
Social Risk
Aversion | (3)
Financial
Risk
Aversion | (4)
Financial
Risk
Aversion | (5)
Physical
Risk
Aversion | (6)
Physical
Risk
Aversion |
VARIABLES						
Social Mobility	-2.961***	-3.019***	-1.672***	-1.696***	-0.696**	-0.720**
	(0.373)	(0.370)	(0.249)	(0.249)	(0.238)	(0.235)
Gender	0.0410	0.0651	-0.00448	0.00580	-0.0643	-0.0546
	(0.0797)	(0.0790)	(0.0515)	(0.0515)	(0.0530)	(0.0525)
Income	-0.00935	0.00104	-0.0157	-0.0113	-0.0413*	-0.0371
	(0.0350)	(0.0346)	(0.0242)	(0.0241)	(0.0205)	(0.0207)
Treatment	0.132*		0.0474		0.116**	
	(0.0561)		(0.0362)		(0.0370)	
Individual-Level Treatment		0.231**		0.107*		0.0294
		(0.0808)		(0.0532)		(0.0467)
Village-Level Treatment		-0.702***		-0.291***		-0.345***
		(0.116)		(0.0721)		(0.0823)
Control	2.501***	3.223***	1.701***	1.982***	0.709***	1.188***
	(0.156)	(0.150)	(0.105)	(0.0995)	(0.0970)	(0.101)
Observations	2604	2604	2604	2604	2604	2604

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

The basic specification is as follows:

$$Y_i = \beta * X + \delta * \texttt{social\_mobility}_i + \epsilon_i \tag{5}$$

where Y_i corresponds to one of the mentioned behavioral variables, X_{i3} is a set of control variables and social mobility corresponds to our created measure of social mobility for individual i. The results are presented in Tables 8.0 A, and 8.0 B (see also Tables A1, A2, A3, A4, and A5 for additional results).

Next, we focus on individuals from the same social status (e.g. middle class, or 2) and compare attitudes of those who are moving down from upper class to middle class to those moving up from lower class to middle class. This will help us to better isolate the effect of mobility from the effect of social class on attitudes. For this, we considered the following OLS specification.

$$Y_i|(w = 2) = \alpha + \gamma * up_i + \delta * down_i + \beta * X_i + \varepsilon_i \tag{6}$$

where $Y_i|(w = 2)$ orresponds to one of the mentioned behavioral variables for individuals of the

third generation whose wealth scale is 2, *up* is a dummy variable indicating that the individual's parents were in a lower income scale, *down* is a dummy variable indicating that the individual's parents were in a higher income scale, X_i contains a set of control variables and ε_i is the robust error term,

Table 8.0 B – Effect on behavioral variables. Subset of people of third generation in level 2.

VARIABLES	*Simple regression model*					
	(1) Social Risk Aversion	(2) Financial Risk Aversion	(3) Physical Risk Aversion	(5) Self Reliance	(6) Life Outlook	(8) Work Ethics
Rise from 1 to 2	0.826***	-0.124	0.139	0.343*	0.759***	-0.132
	(0.295)	(0.206)	(0.150)	(0.208)	(0.168)	(0.184)
Down from 3 to 2	-0.148	-0.103	0.232**	-0.318**	-0.153	-0.460***
	(0.189)	(0.131)	(0.105)	(0.140)	(0.126)	(0.116)
Sex of descendent	0.212	0.237**	-0.0864	0.0163	0.00720	-0.238**
	(0.162)	(0.112)	(0.101)	(0.121)	(0.104)	(0.107)
Wealth Scale	0.258**	-0.167*	-0.0356	-0.113	-0.309***	0.164**
	(0.123)	(0.0884)	(0.0698)	(0.0899)	(0.0728)	(0.0769)
Individual-level treatment	0.505***	-0.00683	0.192*	0.269**	0.166	0.143
	(0.178)	(0.120)	(0.111)	(0.126)	(0.111)	(0.115)
Village-level treatment	-0.598**	0.106	-0.192	-0.103	0.206	-0.356**
	(0.267)	(0.182)	(0.150)	(0.187)	(0.177)	(0.152)
Constant	1.679***	1.958***	0.837***	6.013***	2.155***	3.941***
	(0.494)	(0.341)	(0.270)	(0.340)	(0.305)	(0.291)
Observations	470	470	470	470	470	470
R-squared	0.055	0.019	0.018	0.042	0.099	0.060

Robust Standard Errors in Parentheses
*** $p < 0.01, ** p < 0.05, *p < 0.1$

The results show a significant effect of social mobility on various behavioral variables. First, we found a consistent effect of social mobility on risk aversion attitudes. The results show that a third generation descendant with downward mobility, understood as an individual that is in a worse scale level than his parents, tend to be more risk averse in the physical, social and financial dimensions. Conversely, children who are better off than their parents are less risk averse. These results hold while controlling for additional variables such as a dummy indicating whether the child is better off than his parent, and another dummy variable indicating whether he is worse off.

A similar effect is found for self-reliance, life outlook and work ethics. The results show that individuals that have experienced a downward mobility reported having less self-reliance than those with upward mobility. In a similar fashion, people who faced downward mobility tend to have worse

work ethics and be more cynical or worse life outlook than individuals with upward mobility. In contrast, people who have faced better conditions than their parents tend to be more self-confident, to have a better life outlook and have better work ethic than individuals with downward mobility.

The results show that social mobility does modify individuals' attitudes and behavior. We observe that the channel through which wealth affects individuals' attitudes is related to social mobility, and not solely the absolute level of wealth of the third generation.

8.1 Instrumental Variable Approach

The relationship we establish between mobility and risk aversion for instance might not be causal because mobility of the third generation is endogenous.

Table 8.1 C − First Stage IV Results

VARIABLES	Social Mobility	Social Mobility
Treatment	-0.0153***	
	(-0.00301)	
Individual-Level Treatment		0.0199***
		(-0.00426)
Village-Level Treatment		0.0081
		(-0.00665)
Gender	0.00532	0.00562
	(-0.0043)	(-0.00431)
Income	-0.0364***	-0.0363***
	(-0.00165)	(-0.00165)
Control	0.231***	0.190***
	(-0.00681)	(-0.00711)
Observations	2604	2604

Standard Errors in Parentheses
* p < 0.05 ** p < 0.01 *** p < 0.001

As discussed earlier, we use treatment status of individuals in the first generation (original students, students' unschooled counterparts living near the school and those living in villages without a school) as an instrument for the third generation social mobility. The IV estimating equation is:

$$\text{mfxchange1}_i = X_i^T \beta + \delta \text{treatment} + u_i$$

$$y_i = X_i^T \beta + \gamma \text{mfxchange1}_i + \epsilon_i$$

(7)

where the former is the first stage equation, where the `treatment` variable is used as an instrument for social mobility, and the latter is the second stage equation, where the measure of social mobility

comes from the estimator obtained in the first stage. For the instrumental variable approach to hold, the instrument (`treatment`) should only affect the dependent variable (in this case the measures of behavior and attitudes) only through the effect it has on the instrumental variable (social mobility `mfxchange1`).

The first stage regression (see Table 8.1 C) shows a positive correlation between treatment status and mobility. Education not only has a positive effect on mobility between the first and second generation, but also between the second and third generation. In other words, those whose grandfathers were educated displayed less downward mobility than those whose grandparents were uneducated.

Table 8.1 D – Second Stage: Effect of Mobility on Risk Aversion

VARIABLES	(1) Social Risk Aversion	(2) Social Risk Aversion	(3) Financial Risk Aversion	(4) Financial Risk Aversion	(5) Physical Risk Aversion	(6) Physical Risk Aversion
Social Mobility	-11.59**	-5.678	-4.768*	-2.286	-8.285**	-5.636*
	(3.934)	(3.496)	(2.399)	(2.273)	(2.874)	(2.377)
Gender	0.0869	0.0601	0.0120	0.000763	-0.0239	-0.0359
	(0.0890)	(0.0816)	(0.0534)	(0.0516)	(0.0626)	(0.0573)
Income	-0.323*	-0.113	-0.128	-0.0399	-0.318**	-0.223*
	(0.147)	(0.131)	(0.0884)	(0.0843)	(0.108)	(0.0903)
Control	4.498***	3.296***	2.418***	1.913***	2.465***	1.927***
	(0.815)	(0.726)	(0.493)	(0.469)	(0.605)	(0.502)
Observations	2604	2604	2604	2604	2604	2604

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

The second stage results, displayed in Table 8.1 D, demonstrate the effect of social mobility on the behavioral measures, controlling for the same set of independent variables as in the previous estimation. The results of this second stage regression hold for most of the attitudinal measures. Specifically, all the measures of risk aversion continue to be negatively affected by social mobility. It is noteworthy that the estimated effect of social mobility on the three measures of risk aversion and work ethic are higher than those obtained without the instrumental variable approach. Moreover, the effect of social mobility on mental health turned out to be negative and highly significant, meaning that the worse off a child is compared to his parents, the more negative his mental health indicators are.

9 Conclusion

This study estimates social mobility of the second and third generation descendants of the first elementary school students and their unschooled counterparts. We find evidence of upward mobility for the second generation and downward mobility for the third generation. The evidence also suggests that education has a strong positive effect on intergenerational mobility. Finally, we find that downward mobility is associated with more risk aversion, weaker work ethic, and more negative life outlook.

This paper is one of the first to provide a micro-level analysis of mobility in the developing world and document how it affects social-psychological attitudes and behaviors, such as risk aversion, work ethic, mental health and life outlook. As such, the paper makes an important contribution to the growing literature on the psychological effect of poverty by introducing an important dimension, movement in income and education from parents to children. In other words, the state of mind of the poor depends not only where he or she currently is, but also more importantly whether she or he is moving up or down relative to his or her parents' income. For future research, we aim to further explore the mechanism of downward mobility from the second to the third generation. We also aim to investigate further the relationship between social mobility and mental health with a more rigorous and perhaps clinical measure of this variable. Overall, this paper provides a new approach to study the mechanics of development by focusing on the family as the unit of analysis.

References

Aaronson, Daniel and Bhashkar Mazumder, "Intergenerational Economic Mobility in the U.S., 1940 to 2000," *FRB Chicago Working Paper*, 2005, (2005-12).

Alesina, Alberto and George-Marios Angeletos, "Fairness and redistribution: US vs. Europe," *American Economic Review*, 2005, *95*.

Benabou, Roland and Efe A Ok, "Mobility as progressivity: ranking income processes according to equality of opportunity," Technical Report, National Bureau of Economic Research 2001.

Black, Sandra E. and Paul J. Devereux, "Recent developments in intergenerational mobility," *Handbook of Labor Economics*, 2011, *4*, 1487–1541.

Breen, Richard and Christopher T. Whelan, *Social mobility and social class in Ireland*, Gill and Macmillan, 1996.

__ **and Kristian Bernt Karlson**, "Education and social mobility: New analytical approaches," *European Sociological Review*, 2013.

Case, Anne and Angus Deaton, "Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century," *Proceedings of the National Academy of Sciences*, 2015.

Centenaire, *Centenaire de l'arrivée des missionnaires au pays Agonlin, 1895-1995*, Notre Dame, 1995.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez, "Where is the land of Opportunity? The Geography of Intergenerational Mobility in the United States," *The Quarterly Journal of Economics*, 2014, *129* (4), 1553–1623.

Corak, Miles, "Income inequality, equality of opportunity, and intergenerational mobility," *The Journal of Economic Perspectives*, 2013, pp. 79–102.

D'Almeida, Topor Helene, *Histoire Economique du Dahomey (1890-1920), Tome 1 et Tome 2*, paris:editions l'harmattan ed. 1990.

Dupuis, Paul Henry, "Histoire de l'Eglise du Benin: Aube Nouvelle (Tome 2)," Lyon: Sociétés des Missions Africaines 1961.

Durlauf, Steve N. and Irina Shaorshadze, "Intergenerational Mobility," *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*, 2014.

Erikson, Robert and John H. Goldthorpe, *The constant flux: A study of class mobility in industrial societies*, Oxford University Press, USA, 1992.

Grusky, David B. and Kim A. Weeden, "Does the sociological approach to studying social mobility have a future?," *Mobility and Inequality: Frontiers of Research from Sociology and Economics*, 2006, pp. 85–108.

Jenkins, Stephen, "Snapshots versus movies:'lifecycle biases' and the estimation of intergenerational earnings inheritance," *European Economic Review*, 1987, *31* (5), 1149–1158.

Krueger, A, "The Rise and Consequences of Inequality in the United States, presentation at the Center for American Progress in Washington, DC January 12, 2012," 2012.

Lipset, Seymour Martin and Reinhard Bendix, *Social mobility in industrial society*, Berkeley: University of California Press, 1959.

Loch, Dietmar and Ov Cristian Norocel, "The Populist Radical Right in Europe A Xenophobic Voice in the Global Economic Crisis," 2014.

Mazumder, Bhashkar, "Fortunate sons: New estimates of intergenerational mobility in the United States using social security earnings data," *Review of Economics and Statistics*, 2005, *87* (2), 235–255.

Piketty, Thomas, "Social mobility and redistributive politics," *The Quarterly Journal of Economics*, 1995, pp. 551–584.

Report, France Government, *Gouvernement General de l'Afrique Occidentale Francaise*, editions crete, corbeil(france) ed. 1906.

Tiikkaja, Sanna, Sven Sandin, Ninoa Malki, Bitte Modin, Pär Sparén, and Christina M. Hultman, "Social class, social mobility and risk of psychiatric disorder-a population-based longitudinal study," 2013.

Torche, Florencia, "Analyses of Intergenerational Mobility An Interdisciplinary Review," *The ANNALS of the American Academy of Political and Social Science*, 2015, *657* (1).

Wantchekon, Leonard, "Mobilité Sociale des Premiers Élèves du Benin (1864-1922)," *Base de données, IREEP, Cotonou (Benin)*, 2012.

_ , **Notva Natalija, and Klansja Marko**, "Education and Human Capital Externalities: Evidence from Colonial Benin," *Quarterly Journal of Economics*, 2015, (130), 703–757.

Wilensky, Harold L. and Hugh Edwards, "The skidder: ideological adjustments of downward mobile workers," *American Sociological Review*, 1959, pp. 215–231.

APPENDIX

Table A1 – Effect of Mobility on Mental Health and Life Outlook

VARIABLES	(1) Mental Health	(2) Mental Health	(3) Life Outlook	(4) Life Outlook
Social Mobility	0.0299	0.0324	-2.282***	-2.298***
	(0.120)	(0.120)	(0.203)	(0.203)
Gender	0.0607*	0.0597*	-0.00819	-0.00160
	(0.0259)	(0.0260)	(0.0471)	(0.0470)
Income	-0.0387***	-0.0392***	-0.218***	-0.215***
	(0.0116)	(0.0115)	(0.0197)	(0.0197)
Treatment	0.0757***		-0.0156	
	(0.0183)		(0.0323)	
Individual-Level Treatment		-0.0915***		0.115*
		(0.0265)		(0.0490)
Village-Level Treatment		-0.0508		-0.140*
		(0.0380)		(0.0632)
Control	0.449***	0.662***	2.419***	2.461***
	(0.0526)	(0.0504)	(0.0927)	(0.0762)
Observations	2604	2604	2604	2604

Standard Errors in Parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table A2 – Effect of Upward or Downward Mobility on Risk Aversion, Mental Health, Self-reliance, and Work Ethic using Restricted Sample of Children from Income Group 2

VARIABLES	(1) Social Risk	(2) Social Risk	(3) Financial Risk	(4) Financial Risk	(5) Physical Risk	(6) Physical Risk
Upward/Downward Mobility	-0.877**	-0.926***	0.0186	0.0211	0.0844	0.0721
	(0.278)	(0.271)	(0.184)	(0.185)	(0.142)	(0.142)
Gender	0.0185	0.0852	0.139	0.135	-0.0990	-0.0825
	(0.184)	(0.181)	(0.121)	(0.121)	(0.118)	(0.119)
Income	0.284*	0.330*	-0.0998	-0.102	-0.0298	-0.0185
	(0.144)	(0.141)	(0.0944)	(0.0955)	(0.0820)	(0.0816)
Treatment	-0.172		-0.0538		-0.186	
	(0.152)		(0.0922)		(0.0966)	
Individual-Level Treatment		0.650**		0.0294		0.304*
		(0.200)		(0.132)		(0.133)
Village-Level Treatment		-0.843**		0.106		-0.0639
		(0.304)		(0.191)		(0.176)
Control	2.466***	2.529***	1.869***	1.678***	1.204**	0.788*
	(0.664)	(0.557)	(0.409)	(0.377)	(0.385)	(0.307)
Observations	384	384	384	384	384	384

Standard Errors in Parentheses

* p< 0.05 ** p< 0.01 *** p< 0.001

Note: Mobility equals 1 if child from income group 2 had parents in income group 3 and 0 if the child's parents were in income group 1.

Table A3 – Effect of Upward or Downward Mobility on Risk Aversion, Mental Health, Self-reliance, and Work Ethic using Restricted Sample of Children from Income Group 2

VARIABLES	(7) Mental Health	(8) Mental Health	(9) Self-Reliance	(10) Self-Reliance	(11) Cynicism	(12) Cynicism	(13) Work Ethic	(14) Work Ethic
Upward Mobility	-0.0546	-0.0569	0.338	0.363*	0.569***	0.583***	-0.00198	0.0151
	(0.0815)	(0.0817)	(0.181)	(0.178)	(0.129)	(0.128)	(0.166)	(0.169)
Downward Mobility	-0.0169	-0.0170	-0.181*	-0.180*	-0.249**	-0.249**	-0.224**	-0.223**
	(0.0419)	(0.0418)	(0.0922)	(0.0918)	(0.0801)	(0.0801)	(0.0829)	(0.0822)
Gender	0.0605*	0.0594*	-0.109*	-0.0967	-0.0238	-0.0177	-0.182***	-0.174***
	(0.0260)	(0.0260)	(0.0541)	(0.0540)	(0.0477)	(0.0476)	(0.0480)	(0.0479)
Income	-0.0359**	-0.0364**	-0.0345	-0.0291	-0.112***	-0.109***	0.0519*	0.0556*
	(0.0125)	(0.0125)	(0.0273)	(0.0273)	(0.0233)	(0.0233)	(0.0239)	(0.0237)
Treatment	0.0758***		0.0368		0.00990		0.0815*	
	(0.0184)		(0.0354)		(0.0322)		(0.0321)	
Individual-Level Treatment		-0.0919***		0.143*		0.0837		0.0391
		(0.0265)		(0.0576)		(0.0494)		(0.0501)
Village-Level Treatment		-0.0505		-0.320***		-0.157*		-0.271***
		(0.0381)		(0.0697)		(0.0642)		(0.0626)
Control	0.451***	0.665***	5.722***	5.990***	1.887***	1.999***	3.714***	4.063***
	(0.0461)	(0.0424)	(0.0910)	(0.0773)	(0.0818)	(0.0705)	(0.0825)	(0.0715)
Observations	2604	2604	2604	2604	2604	2604	2604	2604

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table A4 – Effect of Mobility on Self-Reliance and Work Ethic

VARIABLES	(1) Self-Reliance	(2) Self-Reliance	(3) Work Ethic	(4) Work Ethic
Social Mobility	0.0299	0.0324	-2.282***	-2.298***
	(0.120)	(0.120)	(0.203)	(0.203)
Gender	0.0607*	0.0597*	-0.00819	-0.00160
	(0.0259)	(0.0260)	(0.0471)	(0.0470)
Income	-0.0387***	-0.0392***	-0.218***	-0.215***
	(0.0116)	(0.0115)	(0.0197)	(0.0197)
Treatment	0.0757***		-0.0156	
	(0.0183)		(0.0323)	
Individual-Level Treatment		0.0915***		0.115*
		(0.0265)		(0.0490)
Village-Level Treatment		-0.0508		-0.140*
		(0.0380)		(0.0632)
Control	0.449***	0.662***	2.419***	2.461***
	(0.0526)	(0.0504)	(0.0927)	(0.0762)
Observations	2604	2604	2604	2604

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table A5 – Effect of Upward or Downward Mobility on Risk Aversion, Mental Health, Self-reliance, and Work Ethic using Restricted Sample of Children from Income Group 2

VARIABLES	(7) Mental Health	(8) Mental Health	(9) Self-Reliance	(10) Self-Reliance	(11) Cynicism	(12) Cynicism	(13) Work Ethic	(14) Work Ethic
Up/Downward Mobility	0.0441	0.0569	-0.543**	-0.567**	-0.828***	-0.834***	-0.280	-0.309
	(0.0845)	(0.0857)	(0.189)	(0.184)	(0.139)	(0.138)	(0.170)	(0.177)
Gender	0.0820	0.0648	0.00404	0.0367	-0.0155	-0.00765	-0.354**	-0.314*
	(0.0620)	(0.0615)	(0.135)	(0.135)	(0.114)	(0.114)	(0.123)	(0.122)
Income	0.0307	0.0189	-0.0426	-0.0202	-0.175*	-0.170*	0.146	0.174*
	(0.0480)	(0.0484)	(0.0976)	(0.0981)	(0.0811)	(0.0814)	(0.0889)	(0.0852)
Treatment	0.116*		-0.0525		-0.0411		-0.0673	
	(0.0496)		(0.0971)		(0.0896)		(0.0966)	
Individual-Level Treatment		-0.238***		0.287*		0.0971		0.352**
		(0.0640)		(0.141)		(0.123)		(0.133)
Village-Level Treatment		0.145		-0.444*		-0.0776		-0.537**
		(0.115)		(0.195)		(0.183)		(0.178)
Control	0.0812	0.280	6.192***	6.318***	2.763***	2.707***	3.801***	3.944***
	(0.217)	(0.195)	(0.426)	(0.378)	(0.360)	(0.322)	(0.432)	(0.368)
Observations	384	384	384	384	384	384	384	384

Standard errors in parentheses
* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Note: Mobility equals 1 if child from income group 2 had parents in income group 3 and 0 if the child's parents were in income group 1.

Matrices tables and ordered logit tables

Table A6

VARIABLES	Dependent Variable			
	0	1	2	3
Second generation Wealth Scale	-0.257***	0.0994***	0.132***	0.0255***
	(0.00816)	(0.00718)	(0.00598)	(0.00198)
Observations	2,797	2,797	2,797	2,797

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table A7 – First to Second Generation Marginal Effects for Education

	Category			
VARIABLES	0	1	2	3
Second generation Wealth Scale	-0.238***	0.0958***	0.120***	0.0222***
	(-0.00836)	(-0.00691)	(-0.00591)	(-0.00178)
Individual-level treatment	-0.0999***	0.0365***	0.0532***	0.0102***
	(-0.0218)	(-0.00767)	(-0.0123)	(-0.00251)
Village-level treatment	-0.136***	0.0604***	0.0638***	0.0114***
	(-0.0258)	(-0.013)	(-0.0114)	(-0.00218)
Observations	2498	2498	2498	2498

Standard Errors in Parentheses
* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table A8

VARIABLES	(1) Odds-Ratio	(2) Odds-Ratio	(3) Odds-Ratio	(4) Odds-Ratio	(5) Odds-Ratio	(6) Odds-Ratio	(7) Odds-Ratio
Second generation Wealth Scale							
First generation Wealth Scale	1.377***	1.037	1.037	0.968	0.968	1.037	1.037
	(0.0394)	(0.0330)	(0.0330)	(0.0341)	(0.0341)	(0.0330)	(0.0330)
Second generation Wealth Scale		4.051***	4.051***	3.764***	3.764***	4.051***	4.051***
		(0.190)	(0.190)	(0.180)	(0.180)	(0.190)	(0.190)
Individual-level treatment				1.456***	1.456***		
				(0.143)	(0.143)		
Village-level treatment				1.977***	1.977***		
				(0.196)	(0.196)		
Constant cut1	1.268***	1.422***	1.422***	2.047***	2.047***	1.422***	1.422***
	(0.104)	(0.126)	(0.126)	(0.225)	(0.225)	(0.126)	(0.126)
Constant cut2	3.844***	5.901***	5.901***	8.878***	8.878***	5.901***	5.901***
	(0.330)	(0.545)	(0.545)	(1.015)	(1.015)	(0.545)	(0.545)
Constant cut3	7.667***	15.45***	15.45***	23.81***	23.81***	15.45***	15.45***
	(0.702)	(1.541)	(1.541)	(2.902)	(2.902)	(1.541)	(1.541)
Constant cut4	30.12***	92.39***	92.39***	145.4***	145.4***	92.39***	92.39***
	(3.389)	(11.92)	(11.92)	(21.24)	(21.24)	(11.92)	(11.92)
Observations	2,516	2,498	2,498	2,498	2,498	2,498	2,498

Standard Seeform in Parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table A9

VARIABLES	Dependent Variable				
	1	2	3	4	5
First generation Wealth Scale	-0.0725***	-0.00308**	0.0177***	0.0362***	0.0218***
	(-0.00639)	(-0.00156)	(-0.00196)	(-0.00361)	(-0.00229)
Observations	2516	2516	2516	2516	2516

Standard Errors in Parentheses

* p< 0.05 ** p< 0.01 *** p< 0.001

Table A10

VARIABLES	Dependent Variable				
	1	2	3	4	5
First generation Wealth Scale	-0.00739	-0.00112	0.00299	0.00422	0.0013
	(-0.00649)	(-0.00102)	(-0.00263)	(-0.00372)	(-0.00115)
Education	-0.285***	-0.0432***	0.115***	0.163***	0.0500***
	(-0.0098)	(-0.0091)7	(-0.00767)	(-0.00871)	(-0.0037)
Observations	2498	2498	2498	2498	2498

Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table A11

	Dependent Variable				
VARIABLES	1	2	3	4	5
First generation Wealth Scale	0.00649	0.00102	-0.00275	-0.00368	-0.00108
	(-0.00712)	(-0.00113)	(-0.00302)	(-0.00403)	(-0.00118)
Education	-0.267***	-0.0420***	0.113***	0.152***	0.0446***
	(-0.01)	(-0.00896)	(-0.00758)	(-0.00841)	(-0.00336)
Individual-level treatment	-0.0737***	-0.0152***	0.0310***	0.0444***	0.0134***
	(-0.0188)	(-0.00528)	(-0.00798)	(-0.0121)	(-0.00383)
Village-level treatment	-0.146***	-0.00412	0.0599***	0.0707***	0.0199***
	(-0.0224)	(-0.00466)	(-0.00925)	(-0.00962)	(-0.00299)
Observations	2498	2498	2498	2498	2498

Standard Errors in Parentheses
* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table A12 – Dependent Variable: Third Generation Wealth Scale. Ordered Logit Model

VARIABLES	(1)	(2)	(3)
Second Generation Wealth Scale	0.351***	0.395***	-0.00387
	(0.0518)	(0.0554)	(0.0622)
Third Generation Education	1.031***	1.019***	0.780***
	(0.0420)	(0.0429)	(0.0455)
Standardized values of (income)		-0.0645	-0.146***
		(0.0456)	(0.0480)
First * Second Generation Wealth			0.926***
			(0.0388)
Individual-level treatment	0.0380	0.0753	-0.588***
	(0.0918)	(0.0969)	(0.107)
Village-level treatment	0.189	0.193	0.551***
	(0.121)	(0.125)	(0.133)
Constant cut1	2.852***	2.938***	3.468***
	(0.177)	(0.193)	(0.200)
Constant cut2	4.600***	4.673***	5.638***
	(0.196)	(0.211)	(0.223)
Constant cut3	6.170***	6.248***	7.915***
	(0.219)	(0.232)	(0.274)
Constant cut4	7.927***	8.029***	10.10***
	(0.282)	(0.297)	(0.347)
Observations	2,139	2,025	2,025

Robust Standard Errors in Parentheses
* $p< 0.05$ ** $p< 0.01$ *** $p< 0.001$

Table A13

VARIABLES	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5
Second Generation Wealth Scale	-0.0965***	0.0347***	0.0439***	0.0146***	0.00326***
	(0.0135)	(0.00571)	(0.00645)	(0.00234)	(0.000728)
Third Generation Education	-0.249***	0.0896***	0.113***	0.0376***	0.00840***
	(0.0104)	(0.00857)	(0.00705)	(0.00324)	(0.00144)
Standardized values of (income)	0.0158	-0.00567	-0.00717	-0.00238	-0.000532
	(0.0111)	(0.00403)	(0.00507)	(0.00171)	(0.000388)
Individual-level treatment	-0.0183	0.00650	0.00841	0.00280	0.000627
	(0.0236)	(0.00827)	(0.0109)	(0.00364)	(0.000819)
Village-level treatment	-0.0476	0.0186	0.0208	0.00674	0.00150
	(0.0309)	(0.0129)	(0.0130)	(0.00419)	(0.000966)
Observations	2,025	2,025	2,025	2,025	2,025

Robust Standard Errors in Parentheses

* p< 0.05 ** p< 0.01 *** p< 0.001

Table A14

VARIABLES	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5
Second Generation Wealth Scale	0.000896	-0.000359	-0.000461	-6.72e-05	-8.89e-06
	(0.0144)	(0.00577)	(0.00740)	(0.00108)	(0.000143)
Third Generation Education	-0.181***	0.0724***	0.0928***	0.0135***	0.00179***
	(0.0106)	(0.00765)	(0.00618)	(0.00189)	(0.000384)
Standardized values of (income)	0.0337***	-0.0135***	-0.0173***	-0.00253***	-0.000335**
	(0.0111)	(0.00458)	(0.00577)	(0.000904)	(0.000133)
First * Second Generation Wealth	-0.214***	0.0859***	0.110***	0.0161***	0.00212***
	(0.00897)	(0.00780)	(0.00693)	(0.00203)	(0.000462)
Individual-level treatment	0.138***	-0.0611***	-0.0664***	-0.00953***	-0.00126***
	(0.0252)	(0.0123)	(0.0120)	(0.00212)	(0.000366)
Village-level treatment	-0.132***	0.0648***	0.0584***	0.00812***	0.00107***
	(0.0326)	(0.0186)	(0.0127)	(0.00201)	(0.000329)
Observations	2,025	2,025	2,025	2,025	2,025

Robust Standard Errors in Parentheses
* p< 0.05 ** p< 0.01 *** p< 0.001

Table A15

First to Second Generation Predicted Probabilities

Income Transition Matrix

First Generation Income Category	Second Generation Income Category		
	1	2	3
1	65.95%	21.43%	12.62%
2	52.51%	27.30%	20.19%
3	38.69%	30.60%	30.72%

Income Transition Matrix

First Generation Income Category	Second Generation Income Category				
	1	2	3	4	5
1	47.94%	25.68%	11.15%	10.85%	4.37%
2	40.07%	26.89%	13.21%	13.91%	5.92%
3	32.69%	26.86%	15.05%	17.43%	7.98%
4	26.07%	25.59%	16.41%	21.27%	10.67%

Proportions

Income Transition Matrix

First Generation Income Category	Second Generation Income Category		
	1	2	3
1	64.0	25.4	10.6
2	56.0	23.5	20.5
3	38.3	28.3	33.4

Income Transition Matrix

First Generation Income Category	Second Generation Income Category				
	1	2	3	4	5
1	40.0	34.3	12.1	10.6	3.0
2	41.5	27.4	13.1	12.5	5.4
3	33.8	27.4	15.7	13.9	9.3
4	32.5	22.1	12.3	21.9	11.2
5	18.5	12.9	20.5	33.3	14.9

Note: Probabilities computed with an Ordered Probit Model

Table A16

First to Second Generation Predicted Probabilities

Education Transition Matrix

		Second Generation Education			
		0	1	2	3
First Generation Education	0	56.37%	25.13%	14.54%	3.96%
	1	31.24%	29.54%	28.74%	10.48%

Education Transition Matrix

		Third Generation Education				
		1	2	3	4	5
Second Generation Education	0	56.54%	34.80%	6.26%	2.24%	0.16%
	1	11.68%	40.05%	28.77%	17.94%	1.57%
	2	1.33%	8.49%	19.72%	56.91%	13.54%
	3	0.14%	0.96%	2.99%	35.26%	60.65%

Proportions

Education Transition Matrix

		Second Generation Education			
		0	1	2	3
First Generation Education	0	61.49	30.99	6.81	0.71
	1	59.06	30.10	9.28	1.56

Education Transition Matrix

		Third Generation Education				
		1	2	3	4	5
Second Generation Education	0	58.23	25.39	15.71	0.00	0.68
	1	3.74	62.33	13.77	20.17	0.00
	2	0.00	0.74	20.96	58.82	19.49
	3	0.00	0.00	0.00	57.14	42.86

Note: Probabilities computed with an Ordered Probit Model

Table A17

	(1)	(2)	(3)
	Education = 1		
VARIABLES	Primary or Secondary	Primary or Secondary	Primary or Secondary
Private Sector	0.00446	0.00446	0.00852
	(-0.0563)	(-0.0563)	(-0.0547)
Child Education Scale = o		-	-
Individual-level treatment			-0.589***
			(-0.0581)
Village-level treatment			0.332***
			(-0,0726)
Constant	-0.584***	-0.584***	-0.646***
	(-0.0352)	(-0.0352)	(-0.067)
Observations	789	789	789
R-squared	0	0	0.11

Robust Standard Errors in Parentheses

*** $p < 0.01$, $** p < 0.05$, $*p < 0.1$